

## CLAIMS

What is claimed is:

[c1] 1. A computer-implemented method for registering multilingual domain names that include non-ASCII characters, the method comprising:

receiving a request from a user to register a multilingual domain name in a top-level domain (TLD), the multilingual domain name having a specified second-level domain name portion that is composed of non-ASCII characters from a specified non-ASCII character set, each character in the specified character set having an associated numeric value, the second-level domain name portion indicated in the received request by a sequence of the numeric values that are associated with the non-ASCII characters of the second-level domain name portion;

generating an ASCII-Compatible Encoding (ACE) for the specified second-level domain name portion based on the specified character set and the indicated numeric sequence for the second-level domain name portion;

constructing an ASCII domain name whose second-level domain name portion is the generated ACE and whose top-level domain name portion is the TLD;

determining whether the constructed ASCII domain name is available to be registered in the TLD and whether the indicated numeric sequence has already been reserved for another multilingual domain name registered in the TLD; and

when it is determined that the constructed ASCII domain name is available to be registered and that the indicated numeric sequence has not been reserved, registering the multilingual domain name in the TLD by,

generating multiple distinct numeric sequence variants as equivalents for the specified second-level domain name portion of the multilingual

domain name, each generated numeric sequence variant consisting of a sequence of numeric values; and

reserving the generated numeric sequence variants for the multilingual domain name.

[c2] 2. The method of claim 1 including preventing registration of the multilingual domain name in the TLD when it is determined that the ASCII domain name is not available to be registered in the TLD and/or that the indicated numeric sequence has already been reserved.

[c3] 3. The method of claim 1 wherein the generating of the numeric sequence variants is performed before the registering of the multilingual domain name, and wherein the registering of the multilingual domain name is performed only if it is further determined that none of the generated numeric sequence variants has already been reserved.

[c4] 4. The method of claim 1 wherein the generated numeric sequence variants include the indicated numeric sequence.

[c5] 5. The method of claim 1 wherein the receiving of the request from the user includes:

receiving an indication of interest in registering a multilingual domain name that includes characters from a specified non-ASCII character set;

providing a Web page that when displayed with a Web browser includes a field in which the user can specify the second-level domain name portion using non-ASCII characters from the specified character set; and

receiving the request from the Web browser based on an indication from the user.

[c6] 6. The method of claim 1 including, after the multilingual domain name is registered in the TLD:

receiving a request to register in the TLD a second multilingual domain name that is distinct from the multilingual domain name, the second multilingual domain name having a second-level domain name portion that is indicated in the received request by a second sequence of numeric values associated with characters of the second-level domain name portion;

determining that the indicated second sequence of numeric values is one of the generated numeric sequence variants for the multilingual domain name; and

indicating that the second multilingual domain name is not available to be registered based on the determining.

[c7] 7. The method of claim 1 wherein the registering of the multilingual domain name in the TLD includes registering the ASCII domain name in the TLD.

[c8] 8. The method of claim 1 wherein the registering of the multilingual domain name in the TLD includes associating an IP address and/or a URL with the ASCII domain name and/or with the reserved numeric sequence variants.

[c9] 9. The method of claim 1 wherein the registering of the multilingual domain name in the TLD includes associating the multilingual domain name with a server computer system able to receive requests that specify the multilingual domain name and to respond in an appropriate manner.

[c10] 10. The method of claim 1 wherein each of multiple distinct character sets are associated with one or more encoding systems that each assign a numeric value that is unique within that encoding system to each character in that associated character set, and wherein the numeric values that are associated with the non-ASCII characters of the second-level domain name portion of the

multilingual domain name are the unique numeric values assigned to those characters by an encoding system associated with the specified character set.

[c11] 11. The method of claim 1 wherein the generating of the numeric sequence variants includes determining one or more alternative second-level domain name portions that correspond to the specified second-level domain name portion and determining at least one numeric sequence variant for each of the determined alternative second-level domain name portions based on characters included in those alternative second-level domain name portions and on numeric values associated with the included characters.

[c12] 12. The method of claim 1 wherein the generating of the numeric sequence variants includes determining one or more numeric sequences that vary from the indicated numeric sequence in such a manner as to reflect case-folding of characters.

[c13] 13. The method of claim 1 wherein the generating of the numeric sequence variants includes determining a character set distinct from the specified character set that also includes some or all of the non-ASCII characters that compose the specified second-level domain name portion, and generating at least one sequence of numeric values that includes numeric values associated with those included non-ASCII characters for the distinct character set.

[c14] 14. The method of claim 1 wherein the generating of the numeric sequence variants includes determining an alternative set of numeric values associated with some or all of the non-ASCII characters that compose the specified second-level domain name portion, and generating at least one sequence of numeric values that includes the alternative numeric values associated with those included non-ASCII characters.

[c15] 15. The method of claim 1 wherein the generating of the numeric sequence variants includes determining characters of a character set distinct from the specified character set whose meaning is related to a meaning of some or all of the non-ASCII characters that compose the specified second-level domain name portion, and generating at least one sequence of numeric values that includes numeric values associated with those distinct determined characters.

[c16] 16. The method of claim 1 wherein the generating of the numeric sequence variants includes determining a mistake made in selecting some or all of the values that are included in the indicated numeric sequence to reflect an association with the non-ASCII characters of the second-level domain name portion, and including generating one or more numeric sequences that vary from the indicated numeric sequence in such a manner as to correct the determined mistake.

[c17] 17. The method of claim 1 wherein the reserving of the generated numeric sequence variants includes registering domain names in the TLD whose second-level domain name portions are the generated numeric sequence variants

[c18] 18. The method of claim 1 including receiving an indication from the user of one or more types of generated numeric sequence variants to reserve, and wherein the generated numeric sequence variants include at least numeric sequence variants of those types.

[c19] 19. The method of claim 1 including charging the user for the reserving of the generated numeric sequence variants.

[c20] 20. The method of claim 1 including using the registered multilingual domain name by:

receiving a request to resolve a domain name that is identified only by a second sequence of numeric values, the received request from a Web browser of a second user based on a specified URL that contains the domain name, the second sequence of numeric values representing characters of the domain name;

determining that the identified second sequence of numeric values corresponds to the multilingual domain name by matching one of the reserved numeric sequence variants for the multilingual domain name; and

responding to the received request by determining appropriate response information for the multilingual domain name and providing an indication of the determined response information to the Web browser of the second user.

[c21] 21. The method of claim 20 wherein the determined response information is an IP address corresponding to a Web server hosting the multilingual domain name.

[c22] 22. The method of claim 20 wherein the determined response information is an IP address corresponding to a server computer able to receive requests that specify the multilingual domain name and to respond in an appropriate manner.

[c23] 23. The method of claim 20 wherein the determined response information is a URL to which the Web browser of the second user will be redirected.

[c24] 24. The method of claim 20 wherein the registering of the multilingual domain name includes storing response information for the multilingual domain name in a manner associated with the ACE generated for the multilingual domain

name and includes associating an indication of the generated ACE with each of the reserved numeric sequence variants, wherein the determining that the identified second sequence of numeric values corresponds to the multilingual domain name by matching one of the reserved numeric sequence variants for the multilingual domain name includes determining the ACE associated with that one numeric sequence variant, and wherein the response information indicated to the Web browser of the second user is the stored response information associated with the determined ACE.

[c25] 25. The method of claim 20 wherein the second sequence of numeric values is the sequence of the numeric values that was included in the indication of the specified second-level domain name portion of the multilingual domain name.

[c26] 26. The method of claim 20 wherein the determining that the identified second sequence of numeric values corresponds to the multilingual domain name by matching one of the reserved numeric sequence variants for the multilingual domain name includes attempting to identify an IP address associated with the one numeric sequence variant and instead selecting a default IP address based on a failure to identify an associated IP address, the default IP address corresponding to the reserved numeric sequence variants.

[c27] 27. The method of claim 26 wherein the determining that the identified second sequence of numeric values corresponds to the multilingual domain name further includes supplying the selected default IP address to the Web browser of the second user, and wherein a server computer corresponding to the selected default IP address matches the identified second sequence of numeric values to the one reserved numeric sequence variant after receiving a second request from the Web browser of the second user that includes the identified second sequence of numeric values.

[c28] 28. The method of claim 27 wherein the determining of the appropriate response information is performed by the server computer after the receiving of the second request from the Web browser of the second user that includes the identified second sequence of numeric values.

[c29] 29. The method of claim 20 wherein the receiving of the request to resolve the domain name includes determining information about the domain name by using values of one or more HTTP header fields that are part of the received request.

[c30] 30. The method of claim 20 wherein the receiving of the request to resolve the domain name includes determining information about the domain name by using information in a specified URL other than a domain name portion of the URL.

[c31] 31. The method of claim 20 wherein the receiving of the request to resolve the domain name includes determining information about the domain name by using one or more cookies that are received as part of the request.

[c32] 32. The method of claim 20 wherein the receiving of the request to resolve the domain name includes determining information about the domain name by retrieving stored information associated with the second user.

[c33] 33. The method of claim 20 wherein the receiving of the request to resolve the domain name includes determining information about the domain name by retrieving stored information associated with a client computer on which the Web browser of the second user is executing.

[c34] 34. The method of claim 20 wherein the identified second sequence of numeric values is determined to match reserved numeric sequence variants for at



least two distinct multilingual domain names, and including querying the second user as to which of the matched multilingual domain names to be used for the resolving.

[c35] 35. The method of claim 1 including, after the generating of the distinct numeric sequence variants and before the reserving of the generated numeric sequence variants, presenting to the user at least some of the generated numeric sequence variants.

[c36] 36. The method of claim 35 including receiving an indication of one or more selections of the user of one or more of the presented numeric sequence variants, and wherein the reserving of the generated numeric sequence variants is performed only for the selected numeric sequence variants.

[c37] 37. The method of claim 1 wherein the specified character set is a multi-byte character set.

[c38] 38. A computer-implemented method for registering multilingual domain names, the method comprising:

receiving an indication of a multilingual domain name, the indication including one or more numeric values representing one or more characters of the multilingual domain name;

determining whether a combination of the included numeric values is reserved; and

when it is determined that the combination of the included numeric values is not reserved, reserving the combination so as to represent the multilingual domain name.

[c39] 39. The method of claim 38 wherein the reserving of the included numeric value is part of registering the multilingual domain name.

[c40] 40. The method of claim 38 including, when it is determined that the included numeric value is reserved, providing an indication that the multilingual domain name is already registered.

[c41] 41. The method of claim 38 including, when it is determined that the included numeric value is reserved, providing an indication that the multilingual domain name is not available to be registered.

[c42] 42. The method of claim 38 including generating one or more distinct numeric variant values to represent the multilingual domain name, and wherein the included numeric value is not reserved unless it is further determined that none of the generated numeric variant values are reserved.

[c43] 43. The method of claim 38 including generating one or more distinct numeric variant values to represent the multilingual domain name, and reserving at least some of the generated numeric variant values when it is determined that the included numeric value is not reserved.

[c44] 44. The method of claim 38 wherein the reserving of the included numeric value prevents other multilingual domain names whose characters are represented by the included numeric value from being registered.

[c45] 45. The method of claim 38 wherein the reserving of the included numeric value includes associating an indication of an ASCII-Compatible Encoding for the multilingual domain name with the reserved numeric value

[c46] 46. The method of claim 38 wherein the reserving of the included numeric value includes registering an ASCII-Compatible Encoding for the multilingual domain name.

[c47] 47. The method of claim 38 wherein the reserving of the included numeric value includes associating an indication of an IP address with the reserved numeric value.

[c48] 48. The method of claim 38 wherein the reserving of the included numeric value includes associating an indication of a URL with the reserved numeric value.

[c49] 49. The method of claim 38 wherein the multilingual domain name includes non-ASCII characters.

[c50] 50. The method of claim 38 wherein the multilingual domain name includes characters that are outside a subset of characters supported by a DNS system in use.

[c51] 51. The method of claim 38 wherein the receiving of the indication of the multilingual domain name includes receiving an indication of one or more character sets that include at least some of the represented characters.

[c52] 52. The method of claim 38 wherein the receiving of the indication of the multilingual domain name includes receiving an indication of one or more character encoding systems that associate numeric values with at least some of the represented characters.

[c53] 53. The method of claim 38 wherein the numeric values are binary values.

[c54] 54. The method of claim 38 wherein the combination is a sequence of numeric values in an order that reflects an order of the represented characters.

[c55] 55. A computer-readable medium whose contents cause a computing device to register internationalized domain names, by performing a method comprising:

receiving an indication of an internationalized domain name, the indication including one or more numeric values representing one or more characters of the internationalized domain name;

determining whether the included numeric values are reserved; and

when it is determined that the included numeric values are not reserved, reserving the included numeric value so as to represent the internationalized domain name.

[c56] 56. The computer-readable medium of claim 55 wherein the internationalized domain name is a multilingual domain name.

[c57] 57. The computer-readable medium of claim 55 wherein the computer-readable medium is a memory of a computing device.

[c58] 58. The computer-readable medium of claim 55 wherein the computer-readable medium is a data transmission medium transmitting a generated data signal containing the contents.

[c59] 59. The computer-readable medium of claim 55 wherein the contents are instructions that when executed cause the computing device to perform the method.

[c60] 60. A computing device for registering multilingual domain names, comprising:

a first component that is capable of receiving an indication of a multilingual domain name that includes one or more numeric values that represent one or more characters of the multilingual domain name; and

a second component that is capable of determining whether the included numeric value is reserved and of reserving the included numeric value so as to represent the multilingual domain name when it is determined that the included numeric value is not reserved.

[c61] 61. The computing device of claim 60 wherein the first component and the second component are executing in memory of the computing device.

[c62] 62. A computer system for registering multilingual domain names, comprising:

means for receiving an indication of a multilingual domain name, the indication including one or more numeric values that represent one or more characters of the multilingual domain name;

means for determining whether the included numeric value is reserved; and

means for, when it is determined that the included numeric value is not reserved, reserving the included numeric value so as to represent the multilingual domain name.

[c63] 63. A computer-implemented method for processing resolution requests for multilingual domain names, the method comprising:

receiving an indication of a multilingual domain name, the indication including one or more numeric values that represent one or more characters of the multilingual domain name;

determining whether a combination of the included numeric values is reserved; and

when it is determined that the combination of the included numeric values is reserved, responding to the received indication with information previously associated with the combination of the included numeric values to reflect a previous registration of the multilingual domain name.

[c64] 64. The method of claim 63 wherein an indication is not received of a character encoding system to which the include numeric values correspond.

[c65] 65. The method of claim 63 wherein a character encoding system to which the include numeric values correspond cannot be determined.

[c66] 66. The method of claim 63 wherein the information previously associated with the included numeric value is an IP address of a server that is able to process requests for multiple multilingual domain names in an appropriate manner specific to each of those multilingual domain names.

[c67] 67. The method of claim 66 wherein the IP address of the server is associated with the included numeric value in such a manner that the IP address is default response information that is used when response information specific to an indicated domain name is not available.

[c68] 68. The method of claim 63 wherein the information previously associated with the included numeric value is an IP address of a server that hosts the multilingual domain name.

[c69] 69. The method of claim 63 including generating one or more distinct numeric variant values to represent the multilingual domain name, and wherein the responding is performed if any of the generated numeric variant values are reserved.

[c70] 70. The method of claim 63 wherein the responding to the received indication includes using information associated with an indication of an ASCII-Compatible Encoding for the multilingual domain name.

[c71] 71. The method of claim 70 including generating the ASCII-Compatible Encoding based at least in part on the included numeric value.

[c72] 72. The method of claim 70 wherein the ASCII-Compatible Encoding was previously associated with the reserved included numeric value.

[c73] 73. The method of claim 63 wherein the multilingual domain name includes non-ASCII characters.

[c74] 74. The method of claim 63 wherein the multilingual domain name includes characters that are outside a subset of characters supported by a DNS system in use.

[c75] 75. The method of claim 63 wherein the receiving of the indication of the multilingual domain name includes receiving an indication of one or more character sets that include at least some of the represented characters.

[c76] 76. The method of claim 63 wherein the receiving of the indication of the multilingual domain name includes receiving an indication of one or more character encoding systems that associate numeric values with at least some of the represented characters.

[c77] 77. The method of claim 63 wherein the numeric values are binary values.

[c78] 78. The method of claim 63 wherein the combination is a sequence of numeric values in an order that reflects an order of the represented characters.

[c79] 79. A computer-readable medium containing a data structure for use in processing resolution requests for multilingual domain names, the data structure

comprising a multiplicity of entries, each entry corresponding to a reserved multilingual domain name and containing information comprising at least one sequence of one or more numeric values that represents the multilingual domain name,

such that when a resolution request is received for a sequence of one or more numeric values that represent one or more characters of a first multilingual domain name, the received sequence of numeric values can be matched against the information contained in the entries in order to identify the first multilingual domain name.

[c80] 80. The computer-readable medium of claim 79 wherein each of the entries further contains at least one indication of response information to be supplied when the received sequence for the resolution request matches one of the sequences of numeric values contained in the information for the entry.

[c81] 81. The computer-readable medium of claim 80 wherein the response information is an IP address.

[c82] 82. The computer-readable medium of claim 79 wherein each of the entries further contains an indication of an ASCII-Compatible Encoding of the multilingual domain name corresponding to that entry.

[c83] 83. The computer-readable medium of claim 79 further containing an IP address associated with each indicated ASCII-Compatible Encoding.

[c84] 84. The computer-readable medium of claim 79 further containing a URL associated with each indicated ASCII-Compatible Encoding.



[c85] 85. The computer-readable medium of claim 79 wherein the reserved multilingual domain names corresponding to each of the entries are registered domain names.

[c86] 86. The computer-readable medium of claim 79 wherein the computer-readable medium is a data transmission medium transmitting a generated data signal containing the data structure.

[c87] 87. The computer-readable medium of claim 79 wherein the computer-readable medium is one or more computer memories that collectively contain the data structure.

88. The computer-readable medium of claim 79 wherein the computer-readable medium is a data transmission medium transmitting a generated data signal containing the data structure.